

stitute in oleomargarine which supplies practically the same nutritive value at a cost which should be not over about one-half that of butter. Moreover, unless the palate is unduly sensitive, the two products are almost indistinguishable by taste.

Such being the case, it is surprising to find that the federal government imposes a tax of ten cents per pound on colored oleomargarine. It is to be hoped that a recent bill to reduce this tax to one cent per pound will become a law. The uncolored article is white while the addition of proper pigment makes it indistinguishable from butter in color.

Again it is surprising to find further, that the federal government imposes a special license fee on the retailer of oleomargarine and that the state of California adds to this an additional burden of still another license tax. Whether here there might be found an Ethiopian in the woodpile representing dairy interests, is another question. The fact remains that both state and federal governments place a tax on oleomargarine which results in making it unduly expensive or even unobtainable. And this fact is found along with the evident availability of oleomargarine as a proper and inherently economical foodstuff for the very portion of the population which most needs such a source of fat and can least afford to pay for it.

If this were the whole story, it alone would justify investigation and legislative relief. But the matter is made more serious in the light of a report of the department of agriculture for the fiscal year ending June 30, 1912. This report showed after due investigation of some 1500 creameries that of 5154 creams examined, about 60% were sour, dirty or decomposed, and that more than 90% of the creameries themselves were in an unsanitary condition. Only a fourth of them practised sterilization at all. On the other hand, the very process of manufacture of oleomargarine from animal and vegetable fats practically insures a sterile product. Butter is no safer than the cream and milk from which it is made, so far as bacteria are concerned. What germs are in the butter to be had from such creameries as those reported above may well be imagined, and in fact have been abundantly demonstrated. While it is reasonable to hope that the condition of creameries is now better than at the time of the report quoted, still we must pause to consider the relative advantages of doubtful and expensive butter and cheap and reliable oleomargarine.

Since the high cost of living makes the obtaining of proper nutrition a public health problem of the first rank, it ought to be a matter for immediate investigation to determine why oleomargarine should not be available at about half the cost of butter, to every resident of this state who wants it. Furthermore, the manufacture and sale of cream and butter should be subject to the same inspection and sanitary standard as for milk, and this duty should devolve upon the constituted public health authorities.

SPECIAL ARTICLE

ANIMAL EXPERIMENTATION AND MEDICAL PROGRESS.—AN ARGUMENT IN SUPPORT OF A BILL NOW BEFORE THE STATE LEGISLATURE.

By G. H. WHIPPLE, Director of The George Williams Hooper Foundation for Medical Research.

A bill has been recently introduced in the state legislature which is of considerable interest to the medical profession and of much importance to the medical schools of the state. This bill aims to further medical investigation by making available for laboratory purposes such unclaimed dogs and cats in the city pounds as otherwise will be destroyed. The bill provides that universities and medical schools can obtain cats for a fee of fifty cents and dogs for a fee of one dollar paid to the pounds for these unclaimed animals, provided the animals so obtained are kept in a sanitary manner and provided that no surgical operation is performed on these animals except under surgical anaesthesia.

There are many excellent reasons why such a bill should become a law, and some of these reasons are incorporated in this brief review. We wish to point out to the medical profession the reasons why their support will be very well worth while. The members of medical school faculties realize the influence which the practicing members of the medical profession exert in the community because of their close contact with people from every walk in life. We wish to arouse the interest and sympathy of all members of the State Society and gain their active support of this bill. Active support means a real effort to inform people about the bill and about its objects, as well as to use influence on the individual members of the state legislature. The people who will naturally oppose this bill will not fail to bring their objections to the notice of the legislators, and the medical profession should make an effort to inform the proper persons concerning the importance of this legislation.

The medical profession owes the public much information concerning medical subjects. The public is much interested in medicine, and strong support can be obtained by suitable information on medical topics. The public knows little about the important progress which is being made in medicine, surgery, hygiene, etc., and it knows still less about the methods of such progress. Too little is known about the careful painstaking work done in medical laboratories in an effort to find out just how the living body carries out its many functions. It is not fully realized that most of the important steps of progress in medicine have been made through experiments upon animals. It is the combined work of the physiologist, the chemist, and the clinician which makes possible many of the steps in medical progress. Experi-

ments on animals play a very important part in this progress,—it is safe to say an absolutely necessary part. Even the modern methods of diagnosis (e. g. Wassermann reaction) call for the use of animals ("vivisection").

Physicians must realize that any effort made in favor of such legislation will react in at least two ways. It will help this bill to become a law, which will assist the work being done in medical schools. More than that, we are helping to educate the public and to inform the state legislature concerning medical science and progress. This same work is of great value in the fight against pernicious medical legislation which comes up at times before the legislature. Much of the harmful medical legislation in this state and elsewhere is due to inactivity of the medical profession, which should take the public into its confidence, and give people information about its work, its problems, and its hopes for future progress.

Physicians have been known to ask this question of the experimental worker. Of what *practical value* is this or that bit of scientific knowledge? It is not always enough to reply that all accurate knowledge is of great value, and justifies any effort to attain such truthful information. This is a fact, but we must give examples to show how scientific truths of no obvious practical value have turned out to be of the very greatest value to humanity. We can point out that in Franklin's day there was no practical value in the study of electrical phenomena. Studies of the X-ray and radium emanations but a few years ago had only a purely scientific value. Drugs which stained living tissues were studied many years by Ehrlich before he discovered a chemical derivative (salvarsan), which is so destructive to the spirochaetes of syphilis. Examples could be multiplied indefinitely, if space permitted. It is obvious that a clear understanding of vital phenomena in man and animals calls for an enormous amount of difficult work. All knowledge so gained is of great value to the human race whether it appears to be of immediate practical value or not.

Not many years ago dissection of the human body was done under difficulties. Bodies were hard to obtain, and were often stolen or purchased from unscrupulous persons. This was because the public had not been educated to realize the necessity for the dissection of the human body, and individual sentiment was strongly opposed. Since the modern laws have been passed, we know that the unclaimed bodies from the cities supply this need of the medical schools. The matter is properly settled, and there is no agitation against such necessary work. We believe the present situation as regards the dogs presents a striking parallel to the above bit of history, and we hope the matter can be settled in much the same way to the benefit of all concerned. In both cases it is possible to overcome the sentiment of the individual by proper information and education. It is much to be desired that such information come from sympathetic physicians rather than from rabid anti-vivisectionists, who are always ready to spread misinformation before the public.

"Vivisection" to the lay reader means a surgical operation on a conscious animal (dog). Because of this fact, it would be best not to use the term, but it is hard to control the use of a word so firmly fixed in the modern vocabulary. "Animal experimentation" is preferable, but it is well to insist that "vivisection" means any experimental procedure involving the use of a sharp instrument upon a living animal. This includes hypodermic injection, drawing of blood from a vein by means of a needle as well as surgical operations. *It is to be emphasized repeatedly* that surgical operations are always done under surgical anaesthesia (usually ether). Vein puncture in the dog is done without anaesthesia just as it is done in all hospitals on human patients. It is recognized that certain experiments must be done without anaesthesia, as the anaesthetic would defeat the object of the experiment. But such experiments are extremely rare, and are undertaken only after the most mature and careful deliberation. The writer, during twelve years work in research laboratories, has never seen any such experiment performed.

The whole subject of animal experimentation has received the most careful consideration by a committee appointed by the American Medical Association. A set of rules was drafted by this committee, and printed copies of such rules are hung in conspicuous places in practically all research laboratories in this country. These rules make the director of the laboratory responsible for all experiments on animals, and these directors feel this responsibility very keenly. The rules specify the most careful attention for all animals, particularly after any surgical operation. It seems obvious that workers will take great care of the experimental animals if for no other reason than to insure the success of that particular experiment. It is safe to assert that these rules not only in the letter but in the spirit are adhered to by research workers in the modern laboratory. Every effort is made to see that animals receive the same care and attention as do human patients in the modern hospital. Occasional instances of carelessness can be found in the hospital as well as in the research laboratory, but these mistakes should not condemn both institutions.

A great variety of animals is used in the modern laboratory,—rabbits, guinea pigs, rats, mice, frogs, terrapin, sheep, goats, pigs, horses, cattle, chickens, monkeys, *dogs* and *cats*. Some animals are of particular value for certain work. The guinea pig is of great value in the diagnosis of tuberculosis and for the standardization of diphtheria antitoxin. The cat is of great value in the standardization of digitalis. The monkey is of peculiar value in the study of syphilis and infantile paralysis,—in fact, the virus of infantile paralysis can be recognized experimentally with certainty only by its action on the monkey. The dog is of especial value for the study of many problems in the physiology of the liver, pancreas and intestinal tract. Practically all of our knowledge of the condition of tetany has been obtained by means of experiments on the dog. Examples

could be multiplied indefinitely. It is not necessary to point out that all the agitation against animal experiments revolves about the dog and cat. The anti-vivisectionists can gain little attention except as the dog or cat is concerned. People are accustomed to the sacrifice of pigs, sheep and goats for food, and see no reason why these animals should not be sacrificed in the study of disease. The whole question is one of sentiment, which bears not on all animals but on the two animals commonly used as pets. The public must be informed that this bill proposes to make available for medical work only the stray dogs and cats which will otherwise be killed and made into fertilizer. These animals will serve a definite purpose as they will be used in experiments which give information of great value in the study of medicine. The animals receive proper care, and are operated upon only under surgical anaesthesia. At the conclusion of the experiment, the animal is anaesthetized, killed, and a complete autopsy performed.

We may inquire how dogs are usually obtained by the various research laboratories. Dogs are very difficult to secure in most communities, although in some fortunate schools there exist definite agreements by which some city dog pounds furnish the proper number of animals. Some laboratories have made an attempt to breed dogs for use, but this has proved too expensive even for the most richly endowed institution. Purchase of dogs from regular dealers is very expensive, as the dealers usually handle thoroughbred dogs. These dogs are not so resistant as the mongrel toward distemper, which is difficult to eradicate from any large collection of dogs. Most schools are forced to buy dogs from irresponsible persons who collect strays, and sell them to the laboratory. Occasionally stolen dogs are purchased, and this leads to unpleasant complications. The logical and sensible solution of this difficulty is a rational agreement with the neighboring dog pound. It is to be kept in mind that every city pound destroys thousands of dogs and cats every year (4000 dogs per annum in San Francisco). A large research laboratory will scarcely use 200 dogs in the course of a year. We see that only a small fraction of the dogs to be destroyed really come into this discussion. The research laboratories could make very profitable use of a small per cent. of the stray dogs which are annually killed in every large city. There can be no argument but that knowledge of great value can be gained by this experimental work on animals. It seems a proper and justifiable use for certain animals which in any case are bound to be destroyed.

Lack of information concerning actual experimental work and laboratory methods as well as the results obtained by such experiments are in part responsible for the hostile attitude of many intelligent persons towards animal experimentation or "vivisection." The medical profession will accomplish a great good for humanity if it can disseminate accurate information concerning animal experimentation and the great benefits which accrue to humanity through such work.

ORIGINAL ARTICLES

A REPORT OF FIFTY CASES OF TUBERCULOSIS OF THE KIDNEY AND BLADDER CLINICALLY CURED WITHOUT OPERATION.*

By F. S. DILLINGHAM, M. D., Los Angeles.

Surgery in the cases about to be reported has been placed on too firm a footing to be assailed at this late date and I wish to state at the beginning that I firmly believe in surgery and this report is made of cases that have presented themselves with both sides infected or who absolutely refused to be operated. For the sake of brevity no case reports will be given, but a summary of all the cases has been carefully prepared.

Going thoroughly into the past history of these cases the majority state, when closely questioned, that they have had some symptoms of this disease from one to ten years before and that with or without some simple treatment, the symptoms temporarily cleared only to return again. In this class the attacks return at shorter intervals and each attack lasts a little longer till pain drives them to consult some physician.

It is remarkable how long some individual families will allow a hematuria to go almost unnoticed, and sometimes even a nocturnal pollakiuria of every half hour, but pain usually prompts an early consultation. While I admit that the first case has only been clinically cured thirteen years and that this may be due to a quiescent state, still every case began to improve within the first month of treatment, and often within the first week as to their general health and strength as well as their special symptoms. Of the special symptoms the hematuria seemed to clear first and the frequency was the most stubborn, sometimes lasting after all other symptoms, as well as pus and bacilli had ceased.

Several years ago I cystoscoped a case that had typical tuberculous ulceration of the bladder with the usual changes of the ureter orifices, and yet the laboratory reported negative findings. I was so sure of this case that I recatheterized the ureters and this time we ran the electric centrifuge for one hour with the result that we found many bacilli on each slide. Ever since this experience I have insisted on the laboratories allowing their centrifuge to run for one hour, or thirty minutes with the newer extra-high-speed motors. After a reasonable search in some cases no bacilli are found, but a few dots or spores are encountered; in these, a prolonged careful search will practically always show tubercle bacilli. I insist on having an outside laboratory make an independent examination of the specimen at the beginning and end of treatment. Guinea pigs have been used in some of these cases as a final proof, but in the majority of the cases on account of the extra expense to the patient, I have been satisfied with the same careful search of the microscopical slides as was made on the first day the diagnosis was made, par-

* Read before the annual meeting of the California State Medical Society, Fresno, Cal., April 20th, 1916.